**Advanced Materials and Mechanics Lab (AMML)**

* Synthesis and processing of materials: wet-processing equipment, glovebox (< 1% ppm H2O, < 1 ppm O2, 0-10% H2), spin-coater, temperature chambers, ovens, and high-temperature furnace (1700˚C max)
* Denton Desktop Pro DC/RF sputtering system (with 2 target sources)
* Harrick plasma cleaner with a gas control (air, Ar, O2)
* Nano-Mechanical testing: Hysitron TrioboIndenter with heating/cooling stage (-10 to 200˚C), dynamic nanoindentation, and feedback control
* MTS mechanical testers (with temperature chamber and fluid chamber) and low-force Instron tester: tensile testing, creep testing, fatigue testing, bending testing, fracture toughness testing
* Absorption spectroscopic tools for structural and chemical analyses: FT-IR (PerkinElmer Spectrum 100R), UV-Vis-NIR spectrophotometer (PerkinElmer Lambda 950)
* Dynamic light scattering for nanoparticle analyses in solution (Malvern Zetasizer Nano-ZS)
* Contact angle meter (hydrophilicity/hydrophobicity)
* Optical microscopes: Zeiss Axio Imager M1m with motorized X, Y, and Z, Nikon Epiphot-TME, Olympus stereomicroscope, imaging analysis software
* Electrical characterization: dielectric measurements at various frequencies from 20 Hz to 2 MHz, I-V curves and semiconductor parameter analyses, all connected to RF/DC probe station (with high temperature chuck that can heat the samples up to 500˚C)
* Specimen preparation laboratory (diamond saw, semi-automatic polisher, TEM cross-sectional tools, vacuum tools, sample mounting, etc.)
* Computer simulation: FEA (ABAQUS, ANSYS), atomistic simulation (Monte Carlo, molecular dynamics, energy minimization), Thermo-Calc software

**Access to Binghamton University Equipment User Facilities**

* Nano/micro-patterning and deposition/etching tools in cleanroom
* Surface characterization: AFM, Wyko optical profiler, contact profilometer, XPS (ESCA), ellipsometer
* High-resolution and analytical microscopes: FE-SEM, LaB6-SEM, TEM/STEM (EDS, EELS, Energy Filter)
* Crystallography of solids: XRD, EBSD
* Thermal analysis: TGA, TGA-MS, DSC, TMA, DMA
* Micromachining and high-resolution imaging: FEI Nova NanoLab dual-beam system (SEM and FIB)